4. (Amended) The assay of claim 37, wherein the assay composition comprises crude cell extracts from a cell producing CoaX protein.

5. (Amended) The assay of claim 37, wherein the CoaX protein is encoded by a *coaX* gene derived from a pathogenic bacteria selected from the group consisting of *Bordetella pertussis, Borrelia burgdorferi, Campylobacter jejuni, Clostridium difficile, Helicobacter pylori, Neisseria meningitidis, Pseudomonas aeruginosa, Treponema pallidum* and *Xylella fastidiosa.*

9. (Amended) The assay of claim 37, wherein the CoaX is encoded by a *coaX* gene derived from a bacteria selected from the group consisting of *Aquifex aeolicus, Bacillus anthracis, Bacillus halodurans, Bacillus stearothermophilus, Bacillus subtilis, Caulobacter crescentus, Chlorobium tepidum, Clostridium acetobutylicum, Dehalococcoides ethenogenes, Deinococcus radiodurans, Desulfovibrio vulgaris, Geobacter sulfurreducens, Pseudomonas putida, Rhodobacter capsulatus, Thiobacillus ferrooxidans, Streptomyces coelicolor, Synechocystis sp., Thermotoga maritima, Bordetella pertussis, Borrelia burgdorferi, Campylobacter jejuni, Clostridium difficile, Helicobacter pylori, Neisseria meningitidis, Neisseria gonorrhoeae, Porphyromonas gingivalis, Pseudomonas aeruginosa, Treponema pallidum, Xylella fastidiosa* and *Mycobacterium tuberculosis.*

11. (Amended) The assay of claim 37, wherein said composition is further contacted with pantothenate or a pantothenate analog.

12. (Amended) The assay of claim 11, wherein the ability to inhibit the activity of the CoaX protein is determined based on the ability of the test compound to affect levels of pantothenate or pantothenate analog in the assay mixture.

14. (Twice Amended) The assay of claim 37 wherein step (b) further comprises determining the ability of the test compound to bind to the CoaX protein; wherein the compound is identified as a potential antibiotic based on the ability of the compound to bind to and inhibit the activity of the CoaX protein.

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